

S/N 09/945,535

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Kie Y. Ahn et al.

Examiner: Colleen Rodgers

Serial No.: 09/945,535

Group Art Unit: 2813

Filed: August 30, 2001

Docket: 1303.026US1

Customer No.: 73115

Confirmation No.: 2681

Title: HIGHLY RELIABLE AMORPHOUS HIGH-K GATE OXIDE ZrO<sub>2</sub>

SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT

MS Amendment  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

In compliance with the duty imposed by 37 C.F.R. § 1.56, and in accordance with 37 C.F.R. §§ 1.97 *et. seq.*, the enclosed materials are brought to the attention of the Examiner for consideration in connection with the above-identified patent application. Applicants respectfully request that this Information Disclosure Statement be entered and the documents listed on the attached Form 1449 be considered by the Examiner and made of record. Pursuant to the provisions of MPEP 609, Applicants request that a copy of the 1449 form, initialed as being considered by the Examiner, be returned to the Applicants with the next official communication.

Pursuant to 37 C.F.R. §1.97(c)(2), Applicants hereby authorize the Commissioner to charge the fee of \$180.00 as set forth in 37 C.F.R. §1.17(p), to Deposit Account No. 19-0743. Please charge any additional fees or credit any overpayment to Deposit Account No. 19-0743.

Applicant brings to the attention of the Examiner the following Office Actions and responses associated with one or both of the inventors of the instant application and/or the assignee of the instant application. This material is available and accessible at the United States Patent and Trademark Office.

**GATE OXIDES AND METHODS OF FORMING**

02/08/2008 ATRINH 00000071 190743 09945535

Application Serial No. 09/944,981 (Atty Ref 1303.021US1), Notice of Allowance mailed 09-27-04, 5 pgs  
Application Serial No. 09/944,981 (Atty Ref 1303.021US1), Restriction Requirement mailed 06-06-02, 5 pgs

Application Serial No. 09/944,981 (Atty Ref 1303.021US1), Response filed 07-02-02 to Restriction Requirement mailed 06-06-02, 2 pgs

**LOW-TEMPERATURE GROWN HIGH-QUALITY ULTRA-THIN PRASEODYMIUM GATE DIELECTRICS**

Application Serial No. 10/027,315 (Atty Ref 1303.033US1), Restriction Requirement mailed 03-26-03, 7 pgs

Application Serial No. 10/027,315 (Atty Ref 1303.033US1), Response filed 04-25-03 to Restriction Requirement mailed 03-26-03, 2 pgs

**HIGHLY RELIABLE AMORPHOUS HIGH-k GATE DIELECTRIC ZrOxNy**

Application Serial No. 10/052,983 (Atty Ref 1303.031US1), Restriction Requirement mailed 07-25-02, 5 pgs

Application Serial No. 10/052,983 (Atty Ref 1303.031US1), Response filed 08-26-02 to Restriction Requirement mailed 07-25-02, 2 pgs

**EVAPORATED LaAlO3 FILMS FOR GATE DIELECTRICS**

Application Serial No. 10/081,439 (Atty. Ref. 1303.046US1) Notice of Allowance mailed 4-8-05, 5 pgs

**ATOMIC LAYER-DEPOSITED LaAlO3 FILMS FOR GATE DIELECTRICS**

Application Serial No. 10/137,499 (Atty Ref 1303.050US1), Comments on Reasons for Notice of Allowance filed 04-06-06, 1 pg

Application Serial No. 10/137,499 (Atty Ref 1303.050US1), Restriction Requirement mailed 09-20-02, 6 pgs

Application Serial No. 10/137,499 (Atty Ref 1303.050US1), Response filed 10-21-02 to Restriction Requirement mailed 09-20-02, 2 pgs

**ATOMIC LAYER-DEPOSITED HAFNIUM ALUMINUM OXIDE FILMS**

Application Serial No. 10/163,481 (Atty Ref 1303.056US1), Restriction Requirement filed 6-16-2004, 4 pgs

Application Serial No. 10/163,481 (Atty Ref 1303.056US1), Advisory Action mailed 10-13-05, 3 pgs

Application Serial No. 10/163,481 (Atty Ref 1303.056US1), Response filed 10-21-05 to Advisory Action mailed 10-13-05, 23 pgs

Application Serial No. 10/163,481 (Atty Ref 1303.056US1), Comments filed 09-15-06 to Notice of Allowance mailed 06-27-06, 1 pg

Application Serial No. 10/163,481 (Atty Ref 1303.056US1), Response filed 09-15-06 to Notice of Allowance mailed 06-27-06, 3 pgs

Application Serial No. 10/163,481 (Atty Ref 1303.056US1), Notice of Allowance filed 6-27-2006, 4 pgs

Application Serial No. 10/163,481 (Atty Ref 1303.056US1), Response filed 4-5-2006 to Non-Final Office Action mailed 1-5-2006, 23 pgs

Application Serial No. 10/163,481 (Atty Ref 1303.056US1), Response filed 7-7-2004 to Restriction Requirement mailed 6-16-2004, 1 pg.

Application Serial No. 10/163,481 (Atty Ref 1303.056US1), Response filed 10-11-06 to Rule 312 Communication Received, 3 pgs

**A METHOD INCLUDING FORMING GATE DIELECTRICS HAVING MULTIPLE LANTHANIDE OXIDE LAYERS**

Application Serial No. 10/163,686, (Atty Ref 1303.059US1) Advisory Action mailed 3-18-2005, 2 pgs

Application Serial No. 10/163,686, (Atty Ref 1303.059US1) Advisory Action mailed 2-21-2006, 2 pgs

Application Serial No. 10/163,686, (Atty Ref 1303.059US1) Response filed 3-23-2006 to Advisory Action mailed 2-21-2006, 16 pgs

Application Serial No. 10/163,686, (Atty Ref 1303.059US1) Response filed 5-5-2004 to Restriction Requirement mailed 4-5-2004, 1 pgs

Application Serial No. 10/163,686, (Atty Ref 1303.059US1) Restriction Requirement mailed 4-5-2004, 5 pgs

**ATOMIC LAYER DEPOSITED NANOLAMINATES OF HfO2/ZrO2 FILMS AS GATE DIELECTRICS**

Application Serial No. 10/209,581 (Atty Ref 1303.061US1), Non Final Office Action mailed 7-11-03, 6 pgs

Application Serial No. 10/209,581 (Atty Ref 1303.061US1), Response filed 10-14-03 to Non Final Office Action mailed 7-11-03, 19 pgs

Application Serial No. 10/209,581 (Atty Ref 1303.061US1), Non Final Office Action mailed 1-29-04, 4 pgs

Application Serial No. 10/209,581 (Atty Ref 1303.061US1), Response filed 4-27-04 to Non Final Office Action mailed 1-29-04, 18 pgs

Application Serial No. 10/209,581 (Atty Ref 1303.061US1), Notice of Allowance mailed 10-6-04, 7 pgs

Application Serial No. 10/209,581 (Atty Ref 1303.061US1), Notice of Allowance mailed 2-24-05, 6 pgs

#### **LANTHANIDE DOPED TiO<sub>x</sub> DIELECTRIC FILMS BY PLASMA OXIDATION**

Application Serial No. 10/219,870 (Atty Ref 1303.069US1), Restriction Requirement mailed 6-6-03, 5 pgs

Application Serial No. 10/219,870 (Atty Ref 1303.069US1), Response filed 7-7-03 to Restriction Requirement mailed 6-6-03, 1 pgs

#### **LANTHANIDE DOPED TiO<sub>x</sub> DIELECTRIC FILMS**

Application Serial No. 10/219,878 (Atty Ref 1303.070US1) Restriction Requirement mailed 8-6-03, 5 pgs

Application Serial No. 10/219,878 (Atty Ref 1303.070US1) Response filed 9-8-03 to Restriction Requirement mailed 8-6-03, 1 pgs

#### **ATOMIC LAYER DEPOSITED HfSiON DIELECTRIC FILMS WHEREIN EACH PRECURSOR IS INDEPENDENTLY PULSED**

Application Serial No. 10/229,903 (Atty Ref 1303.078US1), Restriction Requirement mailed 07-25-03, 6 pgs

Application Serial No. 10/229903 (Atty Ref 1303.078US1), Response filed 08-25-03 to Restriction Requirement mailed 07-25-03, 6 pgs

Application Serial No. 10/229,903 (Atty Ref 1303.078US1), Response filed 10-31-06 to Notice of Allowance mailed 08-01-06, 3 pgs

Application Serial No. 10/229,903 (Atty Ref 1303.078US1), Advisory Action mailed 05-24-06, 3 pgs

Application Serial No. 10/229,903 (Atty Ref 1303.078US1), Response filed 06-08-06 to Advisory Action mailed 05-24-06, 5 pgs

Application Serial No. 10/229,903 (Atty Ref 1303.078US1), PTO response to rule 312 comm mailed 01-18-07, 2 pgs

#### **ATOMIC LAYER DEPOSITED LANTHANIDE DOPED TiOX DIELECTRIC FILMS**

Application Serial No. 10/233,309 (Atty Ref 1303.079US1), Notice of Non-Compliant Amendment mailed 11-15-04, 4 pgs

Application Serial No. 10/233,309 (Atty Ref 1303.079US1), Response filed 12-15-04 to Non Final Office Action mailed 11-15-04, 17 pgs

Application Serial No. 10/233,309 (Atty Ref 1303.079US1), Advisory Action mailed 05-11-05, 3 pgs

Application Serial No. 10/233,309 (Atty Ref 1303.079US1), Response filed 06-13-05 to Advisory Action mailed 05-11-05, 16 pgs

Application Serial No. 10/233,309 (Atty Ref 1303.079US1), Comments on Statement of Reasons for Allowance mailed 05-05-06, 1 pg

Application Serial No. 10/926,812 (Atty Ref 1303.121US1), Response filed 5-04-2006 to Notice of Allowance mailed 02-09-06, 2 pgs

#### **ATOMIC LAYER DEPOSITED Zr-Sn-Ti-O FILMS USING TiH4**

Application Serial No. 10/309,583 (Atty Ref 1303.082US1), Restriction Requirement mailed 07-28-03, 6 pgs

Application Serial No. 10/309583 (Atty Ref 1303.082US1), Response filed 08-28-03 to Restriction Requirement mailed 07-28-03, 6 pgs

#### **ATOMIC LAYER DEPOSITED Zr-Sn-Ti-O FILMS**

Application Serial No. 10/309,935 (Atty Ref 1303.083US1), Applicant's Comments on Reasons for Notice of Allowance filed 03-08-05, 1 pg

Application Serial No. 10/309,935 (Atty Ref 1303.083US1), PTO Response to Rule 312 filed 03-08-05 mailed 07-05-06, 2 pgs

Application Serial No. 10/309,935 (Atty. Ref. 1303.083US1) Amendment Under 37 CFR 1.312 mailed 03-08-2005, 15 pgs

#### **ATOMIC LAYER DEPOSITED ZrAl<sub>x</sub>O<sub>y</sub> DIELECTRIC LAYERS INCLUDING Zr<sub>4</sub>AlO<sub>9</sub>**

Application Serial No. 10/403,734, (Atty Ref 1303.092US1) Final Office Action mailed 3-1-2006, 10 pgs

Application Serial No. 10/403,734, (Atty Ref 1303.092US1) Non-Final Office Action mailed 6-14-2005, 8 pgs

Application Serial No. 10/403,734, (Atty Ref 1303.092US1) Non-Final Office Action mailed 10-19-2005, 8 pgs

Application Serial No. 10/403,734, (Atty Ref 1303.092US1) Response filed 9-13-2005 to Non-Final Office Action mailed 6-14-2005, 13 pgs

Application Serial No. 10/403,734, (Atty Ref 1303.092US1) Response filed 1-19-2006 to Non-Final Office Action mailed 10-19-2005, 18 pgs

Application Serial No. 10/403,734 (Atty Ref 1303.092US1), Response filed 4-14-2005 to Restriction Requirement mailed 3-16-2005, 13 pgs

Application Serial No. 10/403,734 (Atty Ref 1303.092US1), Restriction Requirement mailed 3-16-2005, 8 pgs

Application Serial No. 10/403,734 (Atty Ref 1303.092US1), Response filed 6-1-2006 to Final Office Action mailed 7-1-2006, 19 pgs

Application Serial No. 10/403,734 (Atty Ref 1303.092US1), Response filed 09-14-05 to Non Final Office Action mailed 06-14-05, 19 pgs

Application Serial No. 10/403,734 (Atty Ref 1303.092US1), Response filed 04-01-06 to Final Office Action mailed 03-01-06, 19 pgs

Application Serial No. 10/403,734 (Atty Ref 1303.092US1), Notice of Allowance mailed 06-30-06, 10 pgs

Application Serial No. 10/403,734 (Atty Ref 1303.092US1), Response filed 09-14-06 to Notice of Allowance mailed 06-30-06, 1 pg

#### **ATOMIC LAYER DEPOSITED ZrTiO<sub>4</sub> FILMS**

Application Serial No. 10/420,307 (Atty Ref 1303.097US1), Notice of Non Compliant Amendment mailed 11-10-04, 2 pgs

Application Serial No. 10/420,307 (Atty Ref 1303.097US1), Response filed 11-19-04 to Notice of Non Compliant Amendment mailed 11-10-04, 9 pgs

Application Serial No. 10/420,307, (Atty Ref 1303.097US1) Response filed 10-28-2004 to Restriction Requirement mailed 9-28-2004, 2 pgs

Application Serial No. 10/420,307, (Atty Ref 1303.097US1) Response filed 7-14-2006 to Restriction Requirement mailed 6-14-2006 p11.pdf, 11 pgs

Application Serial No. 10/420,307, (Atty Ref 1303.097US1) Restriction Requirement mailed 9-28-2004, 5 pgs

Application Serial No. 10/420,307, (Atty Ref 1303.097US1) Restriction Requirement mailed 6-14-2006, 5 pgs

Application Serial No. 10/420,307, (Atty Ref 1303.097US1) Response filed 10-27-2005 to Final Office Action mailed 7-27-2005, 12 pgs

Application Serial No. 10/420,307, (Atty Ref 1303.097US1) Final Office Action mailed 7-27-2005, 11 pgs

Application Serial No. 10/420,307, (Atty Ref 1303.097US1) Notice of allowance mailed 10-17-2006, 4 pgs

Application Serial No. 10/420,307, (Atty Ref 1303.097US1) Non-Final Office Action mailed 2-8-2005, 10 pgs

Application Serial No. 10/420,307, (Atty Ref 1303.097US1) Non-Final Office Action mailed 12-22-2005, 11 pgs

Application Serial No. 10/420,307, (Atty Ref 1303.097US1) Response filed 4-26-2005 to Non-Final Office Action mailed 2-8-2005, 12 pgs

Application Serial No. 10/420,307, (Atty Ref 1303.097US1) Response filed 3-22-2006 to Non-Final Office Action mailed 12-22-2005, 15 pgs

#### **LANTHANIDE OXIDE / HAFNIUM OXIDE DIELECTRICS**

Application Serial No. 10/602,315 (Atty Ref 1303.107US1), Restriction Requirement mailed 05-17-04, 4 pgs

Application Serial No. 10/602,315 (Atty Ref 1303.107US1), Response filed 06-17-04 to Restriction Requirement mailed 05-17-04, 4 pgs

#### **LANTHANIDE OXIDE / HAFNIUM OXIDE DIELECTRIC LAYERS**

Application Serial No. 10/602,323 (Atty. Ref. 1303.101US1) Amendment under 37 C.F.R. filed 02-07-2006, 10 pgs

Application Serial No. 10/602,323 (Atty. Ref. 1303.101US1) Response filed 07/27/2006 Non Final Office Action mailed 04/28/2006, 12 pgs

Application Serial No. 10/602,323 (Atty Ref 1303.101US1), Non Final Office Action mailed 04-28-06, 7 pgs

Application Serial No. 10/602,323 (Atty Ref 1303.101US1), Restriction Requirement mailed 07-23-04, 22 pgs

Application Serial No. 10/602,323 (Atty Ref 1303.101US1), Response filed 08-23-04 to Restriction Requirement mailed 07-23-04, 17 pgs

Application Serial No. 10/602,323 (Atty. Ref. 1303.101US1) Notice of allowance mailed 12/01/2005, 4 pgs

Application Serial No. 10/602,323 (Atty. Ref. 1303.101US1) Notice of allowance mailed 10/20/2006, 2 pgs

Application Serial No. 10/602,323 (Atty. Ref. 1303.101US1) Non Final Office Action mailed 06/06/2005, 9 pgs

Application Serial No. 10/602,323 (Atty. Ref. 1303.101US1) Non Final Office Action mailed 04/28/2006, 6 pgs

Application Serial No. 10/602,323 (Atty. Ref. 1303.101US1) Response filed 09/06/2005 Non-Final Office Action mailed 06/06/2005, 14 pgs

#### **HIGH-QUALITY PRASEODYMIUM GATE DIELECTRICS**

Application Serial No. 10/765,619 (Atty Ref 1303.033US2), Advisory Action mailed 07-14-05, 3 pgs

Application Serial No. 10/765,619 (Atty Ref 1303.033US2), Response filed 07-19-05 to Final Office Action mailed 04-19-05, 15 pgs

#### **LOW-TEMPERATURE GROWN HIGH-QUALITY ULTRA-THIN PRASEODYMIUM GATE DIELECTRICS**

Application Serial No. 10/768,597 (Atty Ref 1303.033US3), Restriction Requirement mailed 08-11-05, 6 pgs

Application Serial No. 10/768,597 (Atty Ref 1303.033US3), Response filed 09-12-05 to Restriction Requirement mailed 08-11-05, 15 pgs

#### **LaAlO3 FILMS**

Application Serial No. 10/789,042 (Atty Ref 1303.050US2), Restriction Requirement mailed 09-29-05, 4 pgs

Application Serial No. 10/789,042 (Atty Ref 1303.050US2), Advisory Action mailed 12-06-06, 3 pgs

Application Serial No. 10/789,042 (Atty Ref 1303.050US2), Response filed 01-05-07 to Advisory Action mailed 12-06-06 and the Final Office Action mailed 09-05-06, 16 pgs

Application Serial No. 10/789,042 (Atty Ref 1303.050US2), Ex Parte Quayle Action mailed 04-10-07, 6 pgs

Application Serial No. 10/789,042 (Atty Ref 1303.050US2), Response filed 06-11-07 to Ex Parte Quayle Action mailed 04-10-07, 14 pgs

Application Serial No. 10/789,042 (Atty. Ref. 1303.050US2) Non Final Office Action mailed 08-30-2007, 12 pgs

Application Serial No. 10/789,042 (Atty Ref 1303.050US2), RCE filed 6-11-07, 11 pgs

Application Serial No. 10/789,042 (Atty Ref 1303.050US2), Response filed 11-30-07 to Non-Final Office Action mailed 8-30-07, 14 pgs.

#### **LANTHANIDE DOPED TiO<sub>x</sub> DIELECTRIC FILMS**

Application Serial No. 10/789,044 (Atty Ref 1303.070US2) Restriction Requirement mailed 3-21-05, 6 pgs

Application Serial No. 10/789,044 (Atty Ref 1303.070US2) Response filed 4-15-05 to Restriction Requirement mailed 3-21-05, 1 pg

Application Serial No. 10/789,044 (Atty Ref 1303.070US2), Advisory Action mailed 12-08-06, 3 pgs

Application Serial No. 10/789,044 (Atty Ref 1303.070US2), Response filed 01-11-07 to Advisory Action mailed 12-08-06, 12 pgs

Application Serial No. 10/789,044 (Atty Ref 1303.070US2), Advisory Action mailed 01-17-06, 3 pgs

#### **HIGHLY RELIABLE AMORPHOUS HIGH-k GATE DIELECTRIC ZrO<sub>x</sub>Ny**

Application Serial No. 10/863,953 (Atty Ref 1303.031US2), Notice of Allowance mailed 11-06-06, 11 pgs

Application Serial No. 10/863,953 (Atty Ref 1303.031US2), Supplemental Notice of Allowance mailed 02-01-07, 4 pgs

#### **ZIRCONIUM-DOPED TANTALUM OXIDE FILMS**

Application Serial No. 10/909,959 (Atty Ref 1303.114US1), Non-Final Office Action mailed 01/09/2008, 13 pgs

Application Serial No. 10/909,959 (Atty Ref 1303.114US1), Response filed 11-8-07 to Final Office Action mailed 8-8-07, 13 pgs.

Application Serial No. 10/909,959 (Atty. Ref. 1303.114US1) Final Office Action mailed 08-08-2007, 10 pgs

Application Serial No. 10/909,959 (Atty. Ref. 1303.114US1) Non Final Office Action mailed 02-20-2007, 9 pgs

Application Serial No. 10/909,959 (Atty. Ref. 1303.114US1) Response filed 05-11-2007 Non-Final Office Action mailed 02-20-2007, 13 pgs

#### **LANTHANIDE OXIDE DIELECTRIC LAYER**

Application Serial No. 10/926,812, (Atty Ref 1303.121US1) Amendment under 37 C.F.R. filed 2/9/2006, 2 pgs

Application Serial No. 10/926,812, (Atty Ref 1303.121US1) Notice of allowance mailed 5/16/2005, 4 pgs

Application Serial No. 10/926,812, (Atty Ref 1303.121US1) Notice of allowance mailed 2/9/2006, 4 pgs

Application Serial No. 10/926,812, (Atty Ref 1303.121US1) Non-Final Office Action mailed 9/29/2005, 5 pgs

Application Serial No. 10/926,812, (Atty Ref 1303.121US1) Response filed 12/29/2005 Non-Final Office Action mailed 9/29/2005, 13 pgs

#### **EVAPORATION OF Y-Si-O FILMS FOR MEDIUM-k DIELECTRICS**

Application Serial No. 10/930,138 (Atty Ref 1303.044US2), Restriction Requirement mailed 01-13-05, 5 pgs

Application Serial No. 10/930,138 (Atty Ref 1303.044US2), Response filed 02-09-05 to Restriction Requirement mailed 01-13-05, 1 pg

### **CRYSTALLINE OR AMORPHOUS MEDIUM-K GATE OXIDES, Y2O3 AND GD2O3**

Application Serial No. 10/930,184 (Atty Ref 1303.021US2 ), Non-Final Office Action mailed 5-5-06, 10 pgs

Application Serial No. 10/930,184 (Atty Ref 1303.021US2), Non Final Office Action mailed 10-20-05, 25 pgs

Application Serial No. 10/930,184 (Atty Ref 1303.021US2), Response filed 01-20-06 to Non Final Office Action mailed 10-20-05, 12 pgs

Application Serial No. 10/930,184 (Atty Ref 1303.021US2) Amendment Under 37 CFR mailed 1-20-06, 12 pgs

Application Serial No. 10/930,184 (Atty Ref 1303.021US2), Non Final Office Action mailed 05-05-06, 9 pgs

Application Serial No. 10/930,184 (Atty Ref 1303.021us2), Response filed 09-05-06 to Non Final Office Action 05-05-06, 10 pgs

### **HfAlO3 FILMS FOR GATE DIELECTRICS**

Application Serial No. 10/930,431 (Atty Ref 1303.056US2), Response filed 11-19-2007 to Final Office Action mailed 10-12-2007, 11 pgs.

Application Serial No. 10/930,431, (Atty Ref 1303.056US2) Response filed 9-11-2007 to Final Office Action mailed 7-11-2007, 11 pgs

Application Serial No. 10/930,431, (Atty Ref 1303.056US2) Final Office Action filed 10-12-2007, 5 Pgs

Application Serial No. 10/930,431 (Atty Ref 1303.056US2), Advisory Action filed 10-17-2006, 2 pgs

Application Serial No. 10/930,431 (Atty Ref 1303.056US2), Advisory Action filed 12-28-2007, 2 pgs

Application Serial No. 10/930,431 (Atty Ref 1303.056US2), Response filed 1-14-08 to Advisory Action mailed 12-28-07, 12 pgs.

### **DEVICES WITH HfSiON DIELECTRIC FILMS WHICH ARE Hf-O RICH**

Application Serial No. 10/930,516 (Atty. Ref. 1303.078US2) Notice of Allowance mailed 08-10-2007, 9 pgs

Application Serial No. 10/930,516 (Atty Ref 1303.078US2), Response filed 11-08-07 to Notice of Allowance mailed 08-10-07, 9 pgs

Application Serial No. 10/930,516 (Atty Ref 1303.078US2), Restriction Requirement mailed 3-28-06, 5 pgs.

Application Serial No. 10/930,516 (Atty Ref 1303.078US2), Response filed 4-26-06 to Restriction Requirement mailed 3-28-06, 9 pgs.

Application Serial No. 10/930,516 (Atty Ref 1303.078US2), Restriction Requirement mailed 5-9-06, 5 pgs

Application Serial No. 10/930,516 (Atty Ref 1303.078US2), Response filed 6-9-06 to Restriction Requirement mailed 5-9-06, 10 pgs

### **LANTHANIDE OXIDE / HAFNIUM OXIDE DIELECTRICS**

Application Serial No. 10/931,340 (Atty Ref 1303.107US2), Non Final Office Action mailed 11-08-05, 10 pgs

Application Serial No. 10/931,340 (Atty Ref 1303.107US2), Applicant's Comments on Reasons for Notice of Allowance filed 09-15-06, 1 pg

### **Zr-Sn-Ti-O FILMS**

Application Serial No. 10/931,341 (Atty. Ref. 1303.082US2) Advisory Action mailed 06-13-2006, 3 pgs

Application Serial No. 10/931,341 (Atty. Ref. 1303.082US2) Response filed 06-26-2006 to Advisory Action mailed 06-13-2006, 15 pgs

Application Serial No. 10/931,341 (Atty. Ref. 1303.082US2) Final Office Action mailed 03-24-2006, 11 pgs

Application Serial No. 10/931,341 (Atty. Ref. 1303.082US2) Response filed 05-24-2006 to Final Office Action mailed 03-24-2006, 15 pgs

Application Serial No. 10/931,341 (Atty Ref 1303.082US2), Preliminary Amendment mailed 11-28-2007, 2 pgs  
Application Serial No. 10/931,341 (Atty Ref 1303.082US2), Final Office Action mailed 9-12-2007, 5 pgs  
Application Serial No. 10/931,341 (Atty. 1303.082US2) Final Office Action Mailed 09/12/2007, 18 pgs.  
Application Serial No. 10/931,341 (Atty Ref 1303.082US2), Response filed 11-13-07 to Final Office Action mailed 9-12-07, 12 pgs.

#### **LANTHANIDE OXIDE / HAFNIUM OXIDE DIELECTRIC LAYERS**

Application Serial No. 10/931,343, (Atty Ref 1303.101US2) Response filed 7/17/2006 Final Office Action mailed 5/15/2006, 7 pgs  
Application Serial No. 10/931,343, (Atty Ref 1303.101US2) Final Office Action mailed 5/15/2006, 9 pgs  
Application Serial No. 10/931,343, (Atty Ref 1303.101US2) Non-Final Office Action mailed 10/26/2006, 5 pgs  
Application Serial No. 10/931,343, (Atty Ref 1303.101US2) Response filed 1/26/2007 Non Final Office Action mailed 10/26/2006, 10 pgs  
Application Serial No. 10/931,343, (Atty Ref 1303.101US2) Notice of allowance mailed 4/23/2007, 2 pgs  
Application Serial No. 10/931,343, (Atty Ref 1303.101US2) Notice of allowance mailed 8/13/2007, 2 pgs  
Application Serial No. 10/931,343, (Atty Ref 1303.101US2) Non-Final Office Action mailed 11/29/2005, 8 pgs  
Application Serial No. 10/931,343, (Atty Ref 1303.101US2) Response filed 2/28/2006 Non-Final Office Action mailed 11/29/2005, 11 pgs  
Application Serial No. 10/931,343 (Atty Ref 1303.101US2), Response filed 9-15-2005 to Restriction Requirement mailed 8-16-2005, 8 pgs  
Application Serial No. 10/931,343 (Atty Ref 1303.101US2), Restriction Requirement mailed 8-16-2005, 8 pgs  
Application Serial No. 10/931,343 (Atty Ref 1303.101US2), Response filed 08-15-06 to Final Office Action mailed 05-15-06, 10 pgs  
Application Serial No. 10/931,343 (Atty Ref 1303.101US2), Advisory Action mailed 07-24-06, 3 pgs

#### **Electronic Devices Having Lanthanide Dielectrics**

Application Serial No. 10/931,365, (Atty Ref 1303.059US2) Advisory Action mailed 7-10-2007, 2 pgs  
Application Serial No. 10/931,365, (Atty Ref 1303.059US2) Response filed 8-7-2006 to Restriction Requirement mailed 7-5-2006, 16 pgs  
Application Serial No. 10/931,365, (Atty Ref 1303.059US2) Restriction Requirement mailed 7-5-2006, 4 pgs

#### **METHOD OF FORMING APPARATUS HAVING OXIDE FILMS FORMED USING ATOMIC LAYER DEPOSITION**

Application Serial No. 10/931,533 (Atty Ref 1303.119US1), Response filed 1-10-08 to Final Office Action mailed 12-31-07, 19 pgs.  
Application Serial No. 10/931,533 (Atty Ref 1303.119US1), Advisory Action mailed 12-31-2007, 2 pgs  
Application Serial No. 10/931,533 (Atty Ref 1303.119US1), Response filed 11-9-2006 to Restriction Requirement mailed 10-10-2006, 11 pgs  
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Application Serial No. 10/931,533 (Atty Ref 1303.119US1), Response filed 12-10-2007 to Final Office Action mailed 10-10-2007, 19 pgs.

#### **LANTHANUM HAFNIUM OXIDE DIELECTRICS**

Application Serial No. 11/010,529, (Atty Ref 1303.126US1) Non-Final Office Action mailed 9/5/2006, 14 pgs

Application Serial No. 11/010,529, (Atty Ref 1303.126US1) Response filed 12/5/2006 Non-Final Office Action mailed 9/5/2006, 17 pgs

Application Serial No. 11/010,529, (Atty Ref 1303.126US1) Notice of allowance mailed 2/13/2007, 2 pgs

Application Serial No. 11/010,529 (Atty Ref 1303.126US1), Preliminary Amendment filed 11-11-2005, 13 pgs

Application Serial No. 11/010,529 (Atty Ref 1303.126US1), Restriction Requirement mailed 6-23-2006, 4 pgs

Application Serial No. 11/010,529 (Atty Ref 1303.126US1), Response filed 7-24-2006 to Restriction Requirement mailed 6-23-2006, 12 pgs

#### **METHODS OF FORMING PrxOy/ZrO2 DIELECTRIC LAYERS BY COMBINATIONS OF ATOMIC LAYER DEPOSITION AND CHEMICAL VAPOR DEPOSITION (as amended)**

Application Serial No. 11/010,766 (Atty. Ref. 1303.129US1) Non Final Office Action mailed 8/8/2007, 17 pgs

#### **METHODS FOR FABRICATING HAFNIUM TANTALUM OXIDE DIELECTRICS**

Application Serial No. 11/029,757 (Atty Ref 1303.127US1), Non-Final Office Action mailed 11-28-2007, 14 Pgs

#### **LANTHANIDE DOPED TiOx DIELECTRIC FILMS BY PLASMA OXIDATION**

Application Serial No. 11/031,289 (Atty Ref 1303.069US3), Response filed 11-13-07 to Non-Final Office Action mailed 8-10-07, 10 pgs.

Application Serial No. 11/031,289 (Atty. Ref. 1303.069US3) Non Final Office Action Mailed 08-10-2007, 13 pgs

Application Serial No. 11/031,289 (Atty Ref 1303.069US3), Non-Final Office Action mailed 01/25/2008, 6 pgs

#### **LOW-TEMPERATURE GROWN HIGH QUALITY ULTRA-THIN CoTiO3 GATE DIELECTRICS**

Application Serial No. 11/036,296 (Atty Ref 1303.030US2), Response filed 8-22-07 to Non-Final Office Action mailed 5-22-07, 6 pgs.

Application Serial No. 11/036,296 (Atty. Ref. 1303.030US2) Notice of Allowance mailed 10/22/2007, 6 pgs

#### **LaAlO3 FILMS FOR ELECTRONIC APPARATUS (as amended)**

Application Serial No. 11/059594 (Atty. Ref. 1303.046US2) Non-Final Office Action mailed 11/2/07, 24 pgs

Application Serial No. 11/059,594 (Atty Ref 1303.046US2), Preliminary Amendment filed 02-16-05, 3 pgs

Application Serial No. 11/059,594 (Atty Ref 1303.046US2), Restriction Requirement mailed 04-06-07, 5 pgs

Application Serial No. 11/059,594 (Atty Ref 1303.046US2), Response filed 05-07-07 to Restriction Requirement mailed 04-06-07, 8 pgs

Application Serial No. 11/059,594 (Atty Ref 1303.046US2), Response filed 2-4-08 to Non-Final Office Action mailed 11-2-07, 14 pgs.

#### **Zr-Sn-Ti-O FILMS**

Application Serial No. 11/084,968 (Atty Ref 1303.083US2), Response filed 07-27-07 to Restriction Requirement mailed 06-27-07, 10 pgs

#### **ALD OF AMORPHOUS LANTHANIDE DOPED TiOX FILMS**

Application Serial No. 11/092,072 (Atty Ref 1303.135US1), Response filed 9-6-07 to Non-Final Office Action mailed 6-15-07, 16 pgs.

Application Serial No. 11/092,072 (Atty Ref 1303.135US1), Response filed 11-2-07 to Final Office Action mailed 10-15-07, 10 pgs.

Application Serial No. 11/092,072 (Atty Ref 1303.135US1) Final Office Action Mailed 10/15/07, 9 pgs

#### **ATOMIC LAYER DEPOSITED TITANIUM SILICON OXIDE FILMS**

Application Serial No. 11/093,104 (Atty Ref 1303.136US1), Response filed 9-27-07 to Non-Final Office Action mailed 6-27-07, 14 pgs.

Application Serial No. 11/093,104, (Atty Ref 1303.136US1) Non-Final Office Action mailed 6/27/2007, 16 pgs

Application Serial No. 11/093,104 (Atty Ref 1303.136US1), Notice of Allowance mailed 12-26-07, 4 pgs.

#### **ATOMIC LAYER DEPOSITED ZIRCONIUM SILICON OXIDE FILMS**

Application Serial No. 11/117,121 (Atty. Ref. 1303.138US1) Notice of Allowance mailed 9/24/07, 8 pgs

Application Serial No. 11/117121 (Atty Ref 1303.138US1 ), Notice of Allowance Mailed 01-22-2008, 16

#### **ATOMIC LAYER DEPOSITION OF A RUTHENIUM LAYER TO A LANTHANIDE OXIDE DIELECTRIC LAYER**

Application Serial No. 11/117,125 (1303.139US1), Restriction Requirement mailed 10-30-07, 6 pgs

Application Serial No. 11/117,125 (Atty Ref 1303.139US1), Restriction Requirement mailed 10-31-07, 6 pgs

#### **ATOMIC LAYER DEPOSITED NANOLAMINATES OF HfO2/ZrO2 FILMS AS GATE DIELECTRICS**

Application Serial No. 11/148,505 (Atty Ref 1303.061US2), Notice of Allowance mailed 9-11-06, 12 pgs

#### **NANOLAMINATES OF HAFNIUM OXIDE AND ZIRCONIUM OXIDE**

Application Serial No. 11/178,914 (Atty Ref 1303.061US3), Restriction Requirement mailed 11-29-07, 5 pgs

Application Serial No. 11/178,914 (Atty Ref 1303.061US3), Response filed 12-28-07 to Restriction Requirement mailed 11-29-07, 9 pgs

#### **ATOMIC LAYER DEPOSITED Zr-Sn-Ti-O FILMS USING TiH4**

Application Serial No. 11/214,693 (Atty. Ref. 1303.082US3) Notice of Allowance Mailed 09-24-2007, 10 pgs.

Application Serial No. 11/214,693 (1303.082US3), Non Final Office Action mailed 10-31-06,

#### **RUTHENIUM GATE FOR A LANTHANIDE OXIDE DIELECTRIC LAYER**

Application Serial No. 11/215412 (Atty. Ref. 1303.121US2) Restriction Requirement mailed 9/24/07, 5 pgs

Application Serial No. 11/215,412 (Atty Ref 1303.121US2), Non-Final Office Action mailed 01/28/2008, 5 pgs

#### **LANTHANIDE DOPED TiOX DIELECTRIC FILMS**

Application Serial No. 11/427,569 (Atty Ref 1303.079US2), Response filed 8-29-07 to Non-Final Office Action mailed 5-29-07, 11 pgs.

Application Serial No. 11/427,569(Atty Ref. 1303.079US2) Notice of Allowance mailed 11/15/2007, 10 Pages

Application Serial No. 11/427,569 (Atty Ref 1303.079US2), Notice of Allowance mailed 11/15/2007, 4 pgs

**ATOMIC LAYER DEPOSITED NANOLAMINATES OF HfO2/ZrO2 FILMS AS GATE DIELECTRICS**

Application Serial No. 11/457,978 (Atty Ref 1303.061US4 ), Non-Final Office Action mailed 12-26-07, 12 pgs.

**ATOMIC LAYER DEPOSITED NANOLAMINATES OF HfO2/ZrO2 FILMS AS GATE DIELECTRICS**

Application Serial No. 11/457,987 (Atty Ref 1303.061US5), Non-Final Office Action mailed 01/25/2008, 26 pgs

**LANTHANIDE OXIDE / HAFNIUM OXIDE DIELECTRIC LAYERS**

Application Serial No. 11/493,074 (Atty Ref 1303.101US3), Restriction Requirement mailed 12-13-07, 9 pgs

Application Serial No. 11/493,074 (1303.101US3), Response filed 01-14-08 to Restriction Requirement mailed 12-13-07, 11 pgs

**LANTHANUM HAFNIUM OXIDE DIELECTRICS**

Application Serial No. 11/584,229 (Atty Ref 1303.126US2), Response filed 1-15-08 to Non-Final Office Action mailed 10-15-07, 16 pgs.

Application Serial No. 11/584,229 (Atty Ref 1303.126US2) Non Final Office Action mailed 10/15/07, 13 pgs

**ATOMIC LAYER DEPOSITED ZIRCONIUM ALUMINUM OXIDE**

Application Serial No. 11/598,437, (Atty Ref 1303.092US3) Non-Final Office Action mailed 10-4-2007, 18 pgs

Application Serial No. 11/598,437 (Atty Ref 1303.092US3), Response filed 1-4-2008 to Non-Final Office Action mailed 10-4-2007, 19 pgs.

Pursuant to 37 C.F.R. 1.98(a)(2), Applicant believes that copies of cited U.S. Patents and Published Applications, and Non-Published Applications identifiable by USPTO Serial Number, are no longer required to be provided to the Office. Notification of this change to this effect was provided in the United States Patent and Trademark Office OG Notice dated October 19, 2004. Thus, Applicant has not included copies of any US Patents or US Patent Applications identifiable by serial number that may be cited with this submission. Should the Office require copies to be provided, Applicant respectfully requests that notice of such requirement be directed to Applicant's below-signed representative. Applicant acknowledges the requirement to submit copies of foreign patent documents and non-patent literature in accordance with 37 C.F.R. 1.98(a)(2).

The Examiner is invited to contact the Applicants' Representative at the below-listed telephone number if there are any questions regarding this communication.

Respectfully submitted,

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Date

6 Feb '08

By

Timothy B. Clise  
Reg. No. 40,957

CERTIFICATE UNDER 37 CFR 1.8: The undersigned hereby certifies that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail, in an envelope addressed to: MS Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on this 6<sup>th</sup> day of February, 2008.

Name

Patricia McNally

Signature

Patricia McNally